CLAIMS

1. A polynucleotide selected from the group consisting of:
(a) a polynucleotide that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO: 2 or 19; and
(b) a polynucleotide that comprises a coding region of the nucleotide sequence of SEQ ID NO: 1 or 18.

2. A polynucleotide comprising galactose transferring activity, selected from the group consisting of:
(c) a polynucleotide that encodes a polypeptide comprising the amino acid sequence of SEQ ID NO: 2 or 19, wherein one or more amino acids are substituted, deleted, added, and/or inserted; and
(d) a polynucleotide that hybridizes with a DNA comprising the nucleotide sequence of SEQ ID NO: 1 or 18 under stringent conditions.

3. A polynucleotide that encodes a fragment of a polypeptide comprising the amino acid sequence of SEQ ID NO: 2 or 19.

4. A vector that comprises the polynucleotide of any one of claims 1 to 3.

5. A host cell that comprises the polynucleotide of any one of claims 1 to 3 or the vector of claim 4.

6. A polypeptide encoded by the polynucleotide of any one of claims 1 to 3.

7. A method for producing the polypeptide of claim 6, which comprises the steps of:
culturing the host cell of claim 5; and
recovering the polypeptide produced from the host cell or the culture supernatant of the same.

8. An antibody that binds to the polypeptide of claim 6.

9. A pharmaceutical composition for treating a patient who requires an increase in the activity or expression of the polypeptide of claim 6, wherein the composition comprises a therapeutically effective amount of a molecule selected from the group consisting of:

(a) the polynucleotide of any one of claims 1 to 3;

(b) the vector of claim 4; and

(c) the polypeptide of claim 6.

10. A pharmaceutical composition for treating a patient who requires suppression of the activity or expression of the polypeptide of claim 6, wherein the composition comprises a therapeutically effective amount of a molecule selected from the group consisting of:

(a) the antibody of claim 8; and

(b) a polynucleotide that suppresses the expression of an endogenous gene encoding the polypeptide of claim 6 *in vivo*.

11. A method of screening for a candidate therapeutic compound for a disease related to abnormal expression of a gene encoding the polypeptide of claim 6, or abnormal activity of the polypeptide of claim 6, which comprises the steps of:

(a) contacting a test compound with the polypeptide of claim 6;

(b) measuring the galactose transferring activity of the polypeptide of claim 6; and

(c) selecting a compound that changes the galactose transferring activity, compared to when the test compound is not contacted.

12. A method of testing for a disease related to abnormal expression of a gene encoding the polypeptide of claim 6, or abnormal activity of the polypeptide of claim 6, which comprises the step of detecting a mutation in the gene or its expression control region, in a patient.

13. The method of claim 12, which comprises the steps of:
(a) preparing a DNA sample from a subject;
(b) isolating a DNA that encodes the polypeptide of claim 6 or its expression control region;
(c) determining the nucleotide sequence of the isolated DNA; and
(d) comparing the nucleotide sequence of the DNA of step (c) with that of a control.

14. The method of claim 12, which comprises the steps of:
(a) preparing a DNA sample from a subject;
(b) cleaving the prepared DNA sample with a restriction enzyme;
(c) separating the DNA fragments by size; and
(d) comparing the size of the detected DNA fragments with that of a control.

15. The method of claim 12, which comprises the steps of:
(a) preparing a DNA sample from a subject;
(b) amplifying a DNA that encodes the polypeptide of claim 6 or its expression control region;
(c) cleaving the amplified DNA with a restriction enzyme;
(d) separating the DNA fragments by size; and
(e) comparing the size of the detected DNA fragments with that of a control.

16. The method of claim 12, which comprises the steps of:
(a) preparing a DNA sample from a subject;
(b) amplifying a DNA that encodes the polypeptide of claim 6 or its expression control region;
(c) dissociating the amplified DNA into a single strand DNA;
(d) separating the dissociated single strand DNA on non-denaturing gel; and
(e) comparing the mobility of the separated DNA on the gel with that of a control.

17. The method of claim 12, which comprises the steps of:
(a) preparing a DNA sample from a subject;
(b) amplifying a DNA that encodes the polypeptide of claim 6 or its expression control region;
(c) separating the amplified DNA on a gel that comprises a gradually increasing concentration of a DNA denaturant; and
(d) comparing the mobility of the separated DNA on the gel with that of a control.

18. A method of testing for a disease related to abnormal expression of a gene encoding the polypeptide of claim 6, which comprises the step of detecting the expression level of the gene in a subject.

19. The method of claim 18, which comprises the steps of:
(a) preparing an RNA sample from a subject;
(b) measuring the amount of RNA that encodes the polypeptide of claim 6 comprised in the RNA sample; and
(c) comparing the measured amount of RNA with that of a control.

20. The method of claim 18, which comprises the steps of:
(a) providing a cDNA sample prepared from a subject, and a board on which a nucleotide probe that hybridizes with a DNA encoding the polypeptide of claim 5 is immobilized;
(b) contacting the cDNA sample with the board;
(c) measuring the expression level of a gene encoding the polypeptide of claim 5 comprised in the cDNA sample, by detecting the intensity of hybridization between the cDNA sample and the nucleotide probe immobilized on the board; and
(d) comparing the measured expression level of the gene encoding the polypeptide of claim 6 with that in a control.

21. The method of claim 18, which comprises the steps of:
(a) preparing a protein sample from a subject;
(b) measuring the amount of the polypeptide of claim 6 comprised in the protein sample; and

(c) comparing the measured amount of the polypeptide with that of a control.

22. The method of any one of claims 12 to 21, wherein the disease is IgA nephropathy or Tn syndrome.

23. An oligonucleotide comprising at least 15 nucleotides that hybridizes with a DNA encoding the polypeptide of claim 6 or an expression control region thereof.

24. A drug comprising the oligonucleotide of claim 23, for testing for a disease related to abnormal expression of a gene encoding the polypeptide of claim 6, or abnormal activity of the polypeptide of claim 6.

25. A pharmaceutical comprising the antibody of claim 8, for testing for a disease related to abnormal expression of a gene encoding the polypeptide of claim 6, or abnormal activity of the polypeptide of claim 6.

26. The pharmaceutical of claim 24 or 25, wherein the disease is IgA nephropathy or Tn syndrome.

27. A genetically altered non-human animal wherein the expression of C1Gal-T2 protein is artificially altered.

28. A genetically altered non-human animal into which an exogenous polynucleotide that encodes C1Gal-T2 protein has been introduced.

29. The genetically altered non-human animal of claim 27 or 28, wherein the non-human animal is a mouse.

30. A cell established from the genetically altered non-human animal of any one of claims 27 to 29.

31. A method of screening for a compound that changes the activity of C1Gal-T2 protein, which comprises the steps of:

(a) administering a test compound to the genetically altered non-human animal of any one of claims 27 to 29, or contacting the test compound with the cell of claim 30;

(b) measuring the activity or expression level of C1Gal-T2 protein in the genetically altered non-human animal or the cell; and

(c) selecting a compound that changes the activity or expression level of C1Gal-T2 protein by comparison with activity in the absence of the test compound.